Chapter 3
Electric Power Supply

3-1. General

a. Studies. When the power requirements for the pumping station have been tentatively established, the adequacy of the intended source of electric power and any limitations of that source must be ascertained before proceeding with station design. The design investigations should disclose:

(1) Maximum available power.

(2) Capacities and location of existing transmission lines, distribution lines, and substations which may be involved in the supply of power to the pumping station.

(3) Voltage regulation characteristics.

(4) The power company's maximum permissible motor in-rush current limitations and short circuit characteristics.

b. Adequacy. The responsibility for the supply of electric energy required for the operation of the pumping stations after completion of the project rests with the local sponsor. Any extension of existing power transmission facilities required to make this energy available at the pumping station site is a construction feature and the responsibility of the Government. In many instances, it will be necessary for the Government to participate in the preliminary negotiations with the utility supplying power in order to ensure that the completed project will have, at minimum rates, an adequate power supply of the proper characteristics. Where feasible, the contract should be made between the local interests and the utility supplier. However, there will be many cases where it will be more advantageous for the Government to enter into a contract which provides for both the extension of power facilities and supply of electric service. In those cases the Government should enter into such a contract with the understanding by all parties that the costs of energy will be assumed by the local interest upon completion of the project, in accordance with OMRR&R responsibilities.

c. Reliability. Power source reliability will be indicated by the number, size, type, and location of generating facilities, and of interconnections with other systems. In this respect, consideration should be given to the short, infrequent periods of operation of the pumping station and to the ability of local governments to direct power distribution under emergency conditions. Owner's operation records of the supply lines to which connections are contemplated are important aids in determining the extent and nature of construction necessary for reliable supply. Factors affecting the reliability of the supply connection between the power source and the pumping station are:

(1) Length, location, and type of construction of the connection.

(2) Location of the point of connection to a different source.

(3) Appropriate switching equipment between the connection and supply circuits.

d. Power rates. In view of the type of operation and the public service these stations render to the community, it has been the practice to request the public utility supplying power to give special rate considerations. These considerations include the waiver of some or all demand and standby charges, and the charging for only the actual energy used. Power rates should be negotiated on the basis of turning over maintenance and repair to the power company for all the power lines and the substation necessary to operate the pumping station. Hydrology studies are a good tool to estimate the amount of pumping required, power usage, and resulting rate structure. Local interests should be asked to participate in the power supply studies.

3-2. Power Supply

a. Construction required. All facilities and construction necessary to supply the electric power required to operate the pumping stations will be provided as part of the flood protection project. The cost of these facilities will be included in the project costs. The construction required may vary from the simple overhead service drop at utilization voltage to extensive installations involving transmission lines, switching, and transformer equipment. The power line should be available at the time that the construction contractor needs temporary power to construct the pumping station. Power costs and temporary substation costs incurred during construction should be borne by the pumping station contractor. The substation should be located and constructed so that access is available to the electric utility for maintenance and repair.

b. Power for lighting and auxiliary services. A continuous electric supply for lighting, heating devices, and miscellaneous control or protective devices is required. The power supply for these auxiliary services may be separate from the main power supply to eliminate the necessity to have continuous energizing of main transformers and switchgear.

c. Emergency power supply facilities. In general, flood protection pumping stations should be considered emergency facilities. Equipment and power supply should be selected primarily on the basis of reliability under emergency conditions. Additional emergency or standby power supply facilities should not be provided unless the power supply is considered unreliable.